

Reply to “Ten easy lessons for good communication of LCA” by Reinout Heijungs (Int J Life Cycle Assess 19(3):473–476. DOI: 10.1007/s11367-013-0662-5)

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While I enjoyed reading the recent editorial by Reinout Heijungs and agree with many of the points raised there, some of these issues require additional perspective or should at least be elaborated on. I would therefore like to offer my opinion on three specific topics: the difference between (or equivalence of) “system expansion” and “substitution,” the ISO conformance of life cycle assessment (LCA) studies published in the *Journal of Life Cycle Assessment* (or elsewhere), and the use of the term “potential” when reporting impact category indicator results.

With regard to the first issue, I am aware of and acknowledge the formal difference of the two concepts, but denying the legitimacy of a practitioner’s claim that she/he is following ISO guidelines when using the substitution approach based on the mere difference between the terms “equivalent” and “equal” is not only highly academic, it is also simply not practical in real life. To reiterate: system expansion means adding additional unit processes to a monofunctional product system to establish functional equivalence with a multifunctional product system. Besides the undesirable side effect that this approach expands your functional unit, the bigger issue is that *this only works if a monofunctional product system that can be expanded is part of your study’s scope*.

In practice, many times, a multifunctional product system is investigated by itself, so the task at hand becomes to eliminate the burden that is attributable to any coproducts from your inventory. In line with Heijungs’ argumentation, following ISO guidelines would mean having to resort to allocation in this case as system expansion in its “pure” form is simply not an option due to the lack of a monofunctional product system to expand. I prefer to believe that this

conclusion would not be within the spirit of the ISO guidelines. If system expansion is generally preferred over allocation, then “system expansion through substitution” should still be preferable over allocation even if it is performed on the multifunctional product system using a negative sign rather than on a—nonexistent—monofunctional product system using a positive sign. After all, the term “expansion” does not preclude the use of a negative sign; the product system under study is nevertheless expanded by the substituted unit process, meaning it is included in the system boundary. This interpretation is not based on science, however, but on common sense—which is something that I sometimes miss in LCA publications.

With regard to the question whether LCA case studies published in the *International Journal of Life Cycle Assessment* can claim to be “ISO-conformant,” I want to side with Heijungs: the answer is definitely no. An article in a peer-reviewed scientific journal by itself does not satisfy the reporting or review requirements outlined in the ISO standards. However, it almost seems like Heijungs does not think that *any* LCA study can *ever* be ISO-conformant based on the cited ISO requirements. Here, I definitely have to disagree. First of all, a standard that no one can realistically conform to would be completely moot and should be withdrawn. Second, the sections referenced in his editorial may capture what needs to be *done* while conducting the LCA study, but not necessarily what needs to be *reported* in order to achieve conformance with the ISO standards. The relevant ISO section that defines these reporting requirements is section 5 of ISO 14044:2006, while his examples are taken from section 4.3 and 4.4. This is an important distinction.

I would further add the qualifier to the above that if there is a third-party report available that conforms with these reporting requirements and—in the case of comparative assertions—has undergone the appropriate critical review, then it is completely legitimate to tout the case study as “ISO-

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conformant” in the respective journal publication. In that case, the authors should either provide the report as supplementary material of the journal article or make it available upon request through the corresponding author.

In addition, I have to point out the inappropriate use of the terms “compliant” and “compliance” in Heijungs’ editorial, which he may take with a grain of salt and accept as yet another confirmation of his observation that even PhDs and professors make mistakes. As acknowledged by the ISO/TC207/SC5 Working Group that recently finalized the soon-to-be-published ISO/TS 14071 on Critical Review Processes and Reviewer Competencies, the term “comply” only applies to laws and regulations, while one can only “conform” to voluntary standards. This is why you will not find the terms “compliance” or “compliant” in the TS. Being from Europe, I know that the term “ISO compliance” has a longstanding history in the local LCA community, so I want to use this opportunity to communicate this difference to a wider audience.

Finally, with regard to the use of the term “potential” when reporting impact category indicator results, Heijungs bases his argument on the Intergovernmental Panel on Climate Change (IPCC) definition of global warming potential (GWP). This argumentation is flawed in two ways: first, you cannot use the IPCC’s GWP definition to draw conclusions about any other impact category other than GWP as IPCC is not concerned with any other impacts. This poses an illegitimate generaliza-

tion. Second and more importantly, the use of the term “potential” in LCA is not at all based on or tied to the IPCC definition, but refers to the fact that LCA addresses only “potential environmental impacts” (as opposed to *actual* environmental impacts), which are relative expressions that are related to the functional unit of a product system (ISO 14044, Introduction). This is also the reason why every LCA report has to include a statement clarifying that “LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks” (ISO 14044:2006, section 5.2). It is therefore good LCA practice to always report LCIA results as “impact potentials” rather than as “impacts” to avoid the impression that LCA calculates actual environmental impacts. Certain elements have used this widespread misapprehension successfully in the past to discredit LCA based on the argument that it does a poor job of calculating actual environmental impacts. Suggesting that the use of the term “potential” is technically wrong is therefore neither in line with the above ISO principles nor particularly helpful in these types of discussions.

I hope I was able to provide some perspective on the above issues and add some gray to the rather black-and-white views expressed by Heijungs. I am the last person that would not enjoy a good “bean counting,” but there are a lot of things in LCA that are simply not as clear-cut as depicted in this recent editorial.